Ascochyta Blight of Pulse Crops

FarmFacts

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Lentil, pea and faba bean all suffer from fungal diseases known as "ascochyta blight". Each crop is affected by a different species of ascochyta. Thus lentil ascochyta will not spread to pea or faba bean or vice versa. The diseases are somewhat similar in appearance and life cycle in each of the three crops; however, there are some differences which are also reflected in control recommendations.

Ascochyta Blight of Lentil:

Ascochyta leaf spots on lentil

Ascochyta blight, caused by the fungus *Ascochyta fabae* f.sp. *lentis* is a serious disease problem in lentil. Yield losses may be as high as 30 to 50% in susceptible varieties such as Eston and Common Chilean, and 15% in moderately resistant varieties such as Laird. Total dollar losses in susceptible varieties can be much higher due to seed discolouration and loss of grade.

Symptoms:

Symptoms appear on leaves, stems and pods as light grey to tan coloured spots, sometimes with a darker margin. The centers of lesions are often speckled with tiny, black fruiting bodies (pycnidia) which contain the spores of the fungus. When disease becomes severe, leaves may drop prematurely and shoots may appear blighted. Dieback and flower and pod abortion are the main causes of yield loss.

Seed discolouration develops later in the season after pods are infected. The seed surface becomes partially or completely brownish purple in colour. Discolouration can continue to develop even after the crop is in the swath, particularly under damp weather conditions. Affected seed may also be shrivelled, and may have patches of whitish fungal growth and pycnidia on the surface.

Disease Cycle:

The fungus overwinters in seed and infected lentil crop debris, but not in the soil. Infected seed is typically discoloured, but not necessarily so. Healthy looking seed can also carry the fungus.

When infected seed is planted, a small proportion of the seedlings emerge diseased. The fungus then spreads from plant to plant, primarily by rain-splashed spores. Spread from distant fields (more than 1/4 mile) is not likely. Unlike ascochyta blight of pea, lentil ascochyta does not spread by wind-borne spores.

The disease is favoured by moist conditions. The frequency of rainfall is more important than total rainfall, with multiple showers favouring spread of the fungus.

Control:

1. Use disease-free seed: To determine whether seed is infected with ascochyta, an agar plate test can be carried out by an accredited seed laboratory for a small fee. Many epidemics originate from infected seed. Thus it is important to use seed testing "none detected" for ascochyta or the best seed available.

Ascochyta blight on pea

There is no safe level for seed infection. In a high rainfall area even seed with as low as 1 or 2% infection can result in an epidemic. If infested seed is to be planted, delay seeding as long as possible, as seed to seedling transmission is reduced in warm soils.

2. Crop rotation: Allow 2 years between lentil crops on the same field, and avoid planting next to the previous year's lentil fields.
3. Resistance: The varieties Laird and Indianhead have moderate resistance to ascochyta blight and suffer less yield loss than susceptible varieties.
4. There are no seed treatments or foliar fungicides registered for control of ascochyta blight at the time of printing. Check current provincial recommendations.
5. Where ascochyta blight has spread into a field from infected lentil residues on an adjacent field, there is a good chance that only the part of the field closest to the source of disease has developed significant levels of blight. Harvesting this area separately might reduce the percentage of discoloured seed for the rest of the field.

Ascochyta Blight of Pea

Three different species of fungi may cause ascochyta blight of pea. *Ascochyta pinodes (Mycosphaerella pinodes)* is the most important in Saskatchewan. It is sometimes referred to as mycosphaerella blight. It causes a severe foliar blight and foot rot, with losses as high as 20% in field peas in western Canada, and 50% in processing peas in eastern Canada. Other ascochyta fungi are *A. pinodella* which causes a foot rot, and *A. pisi* which causes a leaf and pod spot. Surveys conducted in north-east Saskatchewan by Dr. B. Berkenkamp (Agriculture Canada, Melfort) found ascochyta (mycosphaerella) blight in 81% and 100% of fields surveyed in 1987 and 1988 respectively.

Symptoms:

Leaf and stem symptoms include small, purplish-black, irregular flecks, which enlarge up to 5 mm in diameter. Spots may also be brown with darker margins. Severe infection leads to drying of leaves, and stems may be blighted or girdled. On pods, lesions are initially small and dark, but purplish-brown discolouration may become extensive. Pycnidia (small, black spore producing structures) may be produced on leaf or pod spots. Pod infection may lead to seed infection. Infected seed may occasionally be shrunken or discoloured to various degrees, or it may be symptomless. When infected seed is planted, seedlings with leaf spots or foot rot symptoms may be produced, or seedlings may die before emergence. Foot rot appears as purplish-black discolouration just above the soil line.

Disease Cycle:

The fungus overwinters in seed or on infected crop debris. It can also survive for several years in the soil as resting spores. Diseased crop residue is the main source of infection in areas where ascochyta is established. Spores are produced on dead plant tissue during moist weather and are carried by rain splash or wind to other pea plants. Spores are also produced on infected plants of the current season; these spores spread mainly by rain splash. The disease is favoured by wet weather, particularly frequent showers. Disease levels may build up to epidemic proportions during the growing season.

Control:

1. Crop rotation: Where possible peas should not be grown more than once every five years on the same field. This will minimize any risk of re-infection from pea residues or soil-borne spores, and is also valuable for control of other diseases such as root rot. Plant as far as possible from the previous year's pea fields, because crop residues are an important source of ascochyta spores.
2. Tillage: Burying pea stubble will prevent spores from being released into the air, and will also hasten decomposition of infected plant material.

Ascochyta leaf spots on faba bean

3. Use disease-free seed: It is best to use disease-free seed, or seed with the lowest ascochyta count possible. An agar plate test can be carried out for a small fee by a seed lab accredited to conduct ascochyta tests. Using disease-free seed is not as critical for pea as for lentil in major pea growing areas, due to the presence of wind-borne spores produced on pea crop residues of the previous year. However, planting the best seed available always makes good sense and reduces the risk of disease related losses.
4. Resistance: No recommended pea varieties have good resistance to ascochyta blight. The varieties Century and Princess are rated as "very poor" for resistance. Bellevue, Express, Tipu, Titan, Trapper and Victoria are rated as "poor" and Fortune and Tara are rated as "fair".
5. There are no seed treatments presently registered for ascochyta control. Captan and thiram are registered for use against seed rot and seedling blight, but have not proven to be effective against ascochyta in Saskatchewan.

Ascochyta Blight of Faba Bean

Ascochyta blight of faba bean, caused by *Ascochyta fabae* f.sp. *fabae*, is capable of causing serious yield loss, especially in irrigated crops. It has not been common in Saskatchewan in recent years due to the use of disease-free seed.

Symptoms:

Leaf spots are grey to brown in colour, oval in shape, and up to 1 cm in diameter with definite margins. Small, black pycnidia form in the center of lesions, often in a concentric ring pattern. Leaf spots may merge into irregular black patches causing a blighted appearance. Stem lesions are more elongated, usually sunken and reddish brown in colour. Pod lesions are often sunken, tan to black in colour, and frequently have darker margins. Infected seed may be discoloured and shrivelled.

Disease Cycle:

The fungus overwinters both in seed and on infected crop residues. Spores are spread within crops mainly by splashing rain. Resting spores are produced under adverse conditions, but their ability to survive in the soil under field conditions has not been investigated.

Control:

1. Crop rotation: Follow a crop rotation of four years between successive crops of faba bean. Do not plant next to the previous year's faba bean fields.
2. Use disease-free seed: An agar plate test can be carried out for a small fee by seed laboratories accredited to conduct ascochyta tests.
3. Resistance: Currently recommended varieties are susceptible to ascochyta blight, however the older variety Ackerperle has an intermediate level of resistance. The variety Orion is highly susceptible. Encore, Pegasus, Outlook and Aladin are all moderately susceptible.

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